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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/626,209

07/24/2003

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EXAMINER

MENON, KRISHNAN S

ART UNIT

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1797

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/626,209	Applicant(s) DEVOE, IRVING W.	
	Examiner Krishnan S. Menon	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 42,47,48,50-52,68 and 71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 42,47,48,50-52,68 and 71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 42, 47, 48, 50-52, 68 and 71 are pending as amended 12/1/08 in the RCE of 5/14/08. Claims 42 and 50 are independent.

Claim Rejections - 35 USC § 102/103

1. Claims 42, 47, 48, 50-52, 68 and 71 are rejected under 35 U.S.C. 102(b) as being anticipated by, or under 35 USC 103(a) as being obvious over, Loeb (US 3,906,250).

Loeb'250 teaches (see figures) a method of producing energy from a system having a semipermeable barrier separating a pressure chamber and a solvent chamber, wherein the pressure chamber has a solution (sea water) and solvent chamber has a solvent (river water), the solvent flows from the solvent chamber to the pressure chamber across the membrane, and the solvent chamber thus would inherently have a reduced pressure or even vacuum. See also figure 11, which is a closed system with the solvent chamber having only inflow, wherein the solvent chamber is at zero pressure. The solute solution is evaporated with external heat (like solar) in a third chamber – see figure 6 for example – and the solute is recycled as a concentrated solution.

With respect to the limitation,

utilizing the semi-permeable barrier to restrict solute from flowing into the first chamber while allowing the solvent to flow into the second chamber as the solvent flows from the first chamber into the second chamber a void is created in the first chamber such that a vacuum develops in the first chamber and increases the pressure in the diluted solute solution in the second chamber;

the creation of the void and the increase in pressure in the diluted solute solution in the second chamber are inherent in the process of natural osmosis, and are not patentable process steps.

Periodically applying and removing pressure to drive a member to produce movement is taught by the reference - see the figures for the various energy conversion schemes. The 'periodically applying' can mean anything from occasional start and stop to a reciprocating system, and such schemes of energy conversion are within the capability of one of ordinary skill in the art to design.

With respect to claim 50, a displacement of an object, such as a piston, is implied in the reference to a piston in column 11, lines 37-59.

The solvent chamber is pressurized by pumps.

2. Claims 42, 47, 48, 50-52, 68, and 71 are rejected under 35 U.S.C. 102(b) as anticipated by, or in the alternative, under 35 USC 103(a) as being obvious over DE 3121968.

DE teaches a method of pressurizing a solute solution and converting the pressure to energy (by a turbine or by a reciprocating machine, which is a piston machine: see claims 22, page 8, and 28, page 9 of the English translation of the reference; piston in the reciprocating machine has linear displacement) using a solvent

by passing the solvent across into the solution through a semipermeable membrane – see figures. The solution is exhausted after the pressure is converted to energy as claimed. Solvent chamber pressure reduces due to loss of solvent by osmosis, which would inherently create a loss of pressure, or vacuum, as discussed above. The solvent chamber (5) is pressurized by a pump – see figure 1, pump 22. In the figures, for example, figure 1, solvent chamber is (5), solution chamber is (6), and the membrane is (4).

DE teaches solvent recycle; and that the process of evaporation can be optimally selected from the various available methods – see pages 16-20 of the English translation (especially, page 18) – including air circulation, heat pump, and solar energy. Using vacuum for evaporation, particularly at ambient temperature, is known in the art. Even though the reference does not explicitly teach a third chamber, it is implied in terms of evaporation ponds or evaporators and condensers required in the various recycling schemes contemplated by the reference, which include both solvent and concentrated solute solution.

“Periodically applying and removing the increased pressure” to drive a member to produce work can mean anything from occasional start and stop of a system to a reciprocating system. The reference teaches both turbine and reciprocating engines for energy conversion. Actual details to how to set up the system would be within the skill level of one of ordinary skill in the art. The claimed invention does not provide any details that would make the claim patentable over the prior arts.

Response to the Declaration by Dr. McGimpsey:

Paragraphs 1-21 are devoted to explaining how the applicant's disclosure is enabling. These are moot.

Paragraph 22 deals with patentability over the cited prior arts.

The declarant states that both Loeb and the German references function in a continuous manner by providing mechanical energy from a large volume of solvent, or by volume change, i.e., "addition of substantial volume of solvent being continuously added to the solute", whereas the DeVoe invention works by an increase in pressure (not volume) provided by "addition of solvent to the solute solution". The Examiner sees no difference in these stated principles other than one (the references) being large and the other (applicant's) implied as being small.

The declarant also adds that the Loeb and the German system do not rely on pressure because they are not closed systems. However, the declarant fails to explain how the references have "not a closed system". It may be noted that both the references as well as the applicant provide only schematic drawings, and there are no structural details.

The claims do not recite any specific closed systems either, Other than the sealed first and second chambers separated by the membrane. The references also teach sealed first and second chambers separated by the membrane - as can be seen in the figures of DE, and at least fig 7 and 10 of Loeb. Fig 7 and 10 of Loeb in fact teaches closed systems.

The declarant further adds that the present invention recites periodically extracting (a reciprocating system) a portion of the solvent solution at the increased pressure to provide the necessary energy to drive an object and perform mechanical work.

Well, simple mechanical principles state that:

Work = force x displacement;

Force = pressure x area;

Therefore, work = pressure x area x displacement, or

Work = pressure x volume displaced.

Thus, irrespective of the Loeb, German or the inventor's system, the work output is a product of pressure and volume displaced. There is also no evidence that the references have more volume change and operates at lower pressure differential than that of the applicant. For example, Loeb at fig 11 (a closed system!) shows 255 atm pressure for the solute solution at chamber 124 and about 248 atm. pressure differential at the turbine 126, which is by no means small. Applicant does not provide any pressure volume data for his system. It is in fact possible that the pressure differential in Loeb and the German references may be higher than that of the applicant's. Large volume changes in the references may be producing substantially more energy output than what applicant envisages. Thus this whole argument presented is not evidence for patentability.

Any implied argument that the inventor has reciprocating system, whereas the references have turbine systems, is also not persuasive: the references do teach piston or reciprocating systems as alternatives.

Declaration by Mr. DeVoe:

The substance of the declaration is the same as in the McGimpsey declaration, and therefore, the above response is true for this declaration as well.

Response to Arguments

The lengthy arguments and affidavits presented are not commensurate in scope with the claims and the rejection.

Regarding the high pressure chamber of Loeb (Exhibit B1): argument that *high pressure in the second chamber of Loeb* (fig 11, for example: 255 atm) *is produced by the pump* is not accurate. It is produced by the solvent permeating through the membrane, and chamber 124 would have a pressure of 470 atm at equilibrium, had there been no flow through it. With the flow of the solution through the chamber, the chamber pressure is only 255 atm; and to pump the solution to this chamber, the pump has to develop 257 atm. Pump 122 is pumping against the osmotic system in chamber 124. Had there been no osmotic flow in to chamber 124, the pressure in that chamber would have been at or near atmospheric, and the pump would need to develop only sufficient pressure to overcome the pressure drop in the lines to pump the solution to the chamber. **Chamber 124 is a high pressure chamber as used in the invention.**

However, this has no relevance to the claims. And $P=255$ atm is not the hydrostatic pressure provided by the pump, but the system pressure in the chamber. And the work output at turbine 126 is pressure differential x volume flow rate = $248 \cdot (V + \Delta V)$ (See column 12, line 42-45 of Loeb: $P(V + \Delta V)$ m³.atm or work output by the turbine!). The volume pumped by the pump (V) would be small compared to the volume flow rate through the turbine ($V + \Delta V$).

In exhibit C1, applicant argues that Loeb does not show sealed first and second chambers, which is not accurate – see the cited figures – which show closed systems. Similarly, filling the second chamber with solute solution - the figures (see fig 11) show the second chamber as being supplied with concentrated solution.

Regarding the “void” or the “vacuum” created in the first chamber: this argument that applicant’s system actually creates a vacuum or void in the first chamber is counter-productive: any vacuum or void in the first chamber would stop the system from functioning because it will starve for solvent - for the system to work, there has to be a steady supply of solvent. Any reduced pressure or vacuum is inherent in the system.

About periodically applying pressure – Loeb teaches reciprocating system as alternate – see the rejection. Using a reciprocating system in place of the turbine is known in the art; the DE reference also teaches this.

Similarly, contrary to applicant’s argument, the DE reference also teaches the specific items applicant lists as not taught.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Krishnan S Menon/
Primary Examiner, Art Unit 1797